

value and renders the substrate resistive when voltage is applied to the substrate below the threshold voltage value; and

a current carrying formation formed on a first surface of the substrate, the current carrying formation being in electrical communication with the substrate when a voltage is applied to the substrate above the threshold voltage value.

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6. (Amended) The device of claim 1, wherein the substrate includes one or more vias extending from the first surface of the substrate through the substrate to a second, opposing side of the substrate, a surface of the substrate defining the vias comprising current carrying material in electrical communication with the current carrying formation on the first surface of the substrate such that the current carrying formation on the first surface is electrically contactable via the current carrying material within the vias from the second opposing surface of the substrate.

7. (Amended) The device of claim 1, wherein the current carrying formation includes a plurality of current carrying elements separated from each other by a plurality of gaps, the plurality of gaps defining selected regions where a non-conductive layer was formed on the first surface of the substrate.

8. (Amended) The device of claim 1, further comprising a non-conductive layer on the first surface of the substrate, the non-conductive layer having gaps which do not cover regions of the first surface of the substrate, the current carrying formation being positioned in the regions of the first surface of the substrate not covered by the non-conductive layer.

10. (Amended) A device comprising:

a substrate comprising voltage switchable dielectric material which renders the substrate conductive when a voltage is applied to the substrate above a threshold voltage value and renders the substrate resistive when voltage is applied to the substrate below the threshold voltage value, the substrate having a first surface and a second surface opposing the first surface, the substrate further including one or more vias extending through the substrate between the first and second surfaces;

a current carrying formation formed on the first surface, a current carrying formation formed on the second surface, and current carrying material within the one or more vias which place the current carrying formations on the first and second surfaces in electrical communication with each other, the current carrying formations on the first and second surfaces being in electrical communication with the substrate when a voltage is applied to the substrate above the threshold voltage value.

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18. (Amended) A device comprising:

a substrate comprising voltage switchable dielectric material which renders the substrate conductive when a voltage is applied to the substrate above a threshold voltage value and renders the substrate resistive when voltage is applied to the substrate below the threshold voltage value; and

a current carrying formation formed on a first surface of the substrate, the current carrying formation being formed by a process that includes contacting the substrate with a current carrying formation precursor while applying a voltage to the substrate above the threshold voltage value such that the substrate is conductive.

19. (Amended) The device of claim 18, wherein the current carrying formation includes a plurality of current carrying elements separated from each other by a plurality of gaps, the plurality of gaps defining selected regions where a non-conductive layer was formed on the first surface of the substrate

20. (Amended) The device of claim 19, wherein the non-conductive layer was formed from a photo-imageable material that was imaged to define the selected sections of the first surface of the substrate, and then subsequently removed from the substrate.

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26. (Amended) The device of claim 18, wherein the threshold voltage value for the substrate is between 10 volts and 300 volts.

27. (Amended) The device of claim 18, wherein the threshold voltage value for the substrate is between 30 volts and 100 volts.

28. (Amended) The device of claim 18, wherein the substrate includes one or more vias extending from the first surface of the substrate through the substrate to a second, opposing side of the substrate, a surface of the substrate defining the vias comprising current carrying material in electrical communication with the current carrying formation on the first surface of the substrate such that the current carrying formation on the first surface is electrically contactable via the current carrying material within the vias from the second opposing surface of the substrate.

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29. (Amended) The device of claim 28, wherein the current carrying material within the vias is formed by a process comprising rendering the substrate conductive.

30. (Amended) The device of claim 28, wherein the current carrying material within the vias is formed by a process that includes using an electrode to plate the current carrying formation on the first surface of the substrate while a voltage is applied to the substrate that is sufficient to cause the substrate to be conductive.

31. (Amended) A device comprising:

a substrate comprising voltage switchable dielectric material which renders the substrate conductive when a voltage is applied to the substrate above a threshold voltage value and renders the substrate resistive when voltage is applied to the substrate below the threshold voltage value, the substrate having a first surface and a second surface opposing the first surface, the substrate further including one or more vias extending through the substrate between the first and second surfaces; and

a current carrying formation formed on the first surface, a current carrying formation formed on the second surface, and current carrying material within the one or more vias, the current carrying formation being formed by one or more processes which include contacting the substrate with a current carrying formation precursor while applying a voltage to the substrate that is sufficient to cause the substrate to be conductive.

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32. (Amended) The device of claim 31, wherein the current carrying formations on the first and second surfaces of the substrate include a plurality of current carrying elements separated by a plurality of gaps, the plurality of gaps on each of the first and second surfaces defining selected regions where a corresponding non-conductive layer was formed.

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49. (Amended) A semiconductor device including a substrate upon which circuitry forming the functionality of the semiconductor device is positioned, wherein the improvement comprises:

a substrate comprising voltage switchable dielectric material which renders the substrate conductive and in electrical communication with the circuitry when a voltage is applied to the substrate above a threshold voltage value and renders the substrate resistive when voltage is applied to the substrate below the threshold voltage value.

50. (Amended) The semiconductor device of claim 49, wherein the semiconductor device is selected from a group consisting of integrated circuit devices, computer processors, computer readable memory devices, motherboards, and PCB.

Please add the following new claims:

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1 51. The device of claim 1, wherein the threshold voltage value for the substrate is  
2 between 10 volts and 300 volts.

1 52. The device of claim 1, wherein the threshold voltage value for the substrate is  
2 between 30 volts and 100 volts.

1 53. The device of claim 10, wherein the threshold voltage value for the substrate is  
2 between 10 volts and 300 volts.

1 54. The device of claim 10, wherein the threshold voltage value for the substrate is  
2 between 30 volts and 100 volts.

1 55. The device of claim 49, wherein the threshold voltage value for the substrate is  
2 between 10 volts and 300 volts.

1 56. The device of claim 49, wherein the threshold voltage value for the substrate is  
2 between 30 volts and 100 volts.

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1 57. A semiconductor device comprising:

3 a substrate comprising voltage switchable dielectric material which renders the  
4 substrate conductive when a voltage is applied to the substrate above a threshold voltage  
5 value and renders the substrate resistive when voltage is applied to the substrate below the  
6 threshold voltage value; and

7 circuitry formed on a first surface of the substrate, the current carrying formation  
8 being in electrical communication with the circuitry when a voltage is applied to the substrate  
above the threshold voltage value.

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1 58. The semiconductor device of claim 57, wherein the substrate includes one or more  
2 vias extending from the first surface of the substrate through the substrate to a second,  
3 opposing side of the substrate, a surface of the substrate defining the vias comprising current  
4 carrying material in electrical communication with the circuitry on the first surface of the  
5 substrate such that the circuitry is electrically contactable via the current carrying material  
6 within the vias from the second opposing surface of the substrate.

1 59. The semiconductor device of claim 57, wherein the substrate includes one or more  
2 vias extending from the first surface of the substrate through the substrate to a second,  
3 opposing side of the substrate, a surface of the substrate defining the vias comprising current  
4 carrying material in electrical communication with the circuitry on the first surface of the  
5 substrate, and the second, opposing side of the substrate comprising circuitry such that the  
6 circuitry on the first and second sides are in electrical communication with each other via the  
7 current carrying material within the vias.

1 60. The semiconductor device of claim 57, wherein the threshold voltage value for the  
2 substrate is between 10 volts and 300 volts.

1 61. The semiconductor device of claim 57, wherein the threshold voltage value for the  
2 substrate is between 30 volts and 100 volts.